IN THE CLAIMS

Please amend claims 1, 3, 15, 16, 21-23, 25, 37, 38, 43, and 44 and cancel claims 12-14, 18, 34-36, 40, 45, and 46. Thus, claims 1-44 are pending upon entry of this amendment.

1. (Currently Amended) A method for detecting a non-nucleic acid compound of interest in a biological or environmental sample comprising the steps of:

a) providing a binding construct comprising ~~a non-nucleic acid recognition portion~~ an antibody or an antibody fragment portion which specifically recognizes and specifically binds said non-nucleic acid compound of interest without capture on a solid support, and a nucleic acid portion;

b) mixing said binding construct with said biological sample in a solution mixture to form construct-compound complexes in solution without capture on a solid support, wherein ~~essentially all of~~ said non-nucleic acid compound of interest in said biological or environmental sample becomes specifically bound to said binding construct;

c) providing one or more surfaces, wherein said ~~surface bears~~ surfaces bear one or more accessible non-nucleic acid binding targets capable of specifically recognizing and specifically binding to said antibody or said antibody fragment ~~non-nucleic acid recognition~~ portion of said binding construct;

d) introducing said one or more surfaces to said solution mixture of said construct-compound complexes after ~~essentially all of~~ said non-nucleic acid compound of interest in said biological or environmental sample has become bound to said binding construct in order for said one or more surfaces to form construct-surface complexes in solution with any ~~and essentially all~~ unbound binding constructs resulting in said solution mixture containing essentially said construct-compound complexes and said construct-surface complexes;

e) separating said construct-surface complexes from said solution mixture leaving behind said construct-compound complexes in solution; and

f) detecting the presence or absence of said nucleic acid portion of said binding construct in solution without captures on a solid support;

wherein the presence of said nucleic acid portion of said binding construct indicates the presence of said non-nucleic acid compound of interest in said biological or environmental sample.

2. (Original) The method of claim 1, wherein said one or more surfaces is selected from the group consisting of: particles, powders, beads, planar surfaces, non-planar surfaces, a tube, a well, non-porous films, non-porous membranes, porous films, porous membranes, fibers, fillers, meshes, grids, filters, matrices, gels, and combinations thereof.

3. (Currently Amended) The method of claim 1, wherein said one or more surfaces ~~comprises~~ comprise particles.

4. (Original) The method of claim 3, wherein said particles comprise magnetic particles.

5. (Original) The method of claim 4, wherein said step (e) comprises separating said construct-surface complexes out of said mixture by means of a magnet.

6. (Original) The method of claim 1, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

7. (Original) The method of claim 1, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid

portion.

8. (Previously Presented) The method of claim 7, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

9. (Previously Presented) The method of claim 5, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

10. (Previously Presented) The method of claim 5, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

11. (Previously Presented) The method of claim 10, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Currently Amended) The method of claim 1, wherein said antibody or antibody fragment ~~non-nucleic acid recognition~~ portion comprises a single chain antibody variable region fragment.

16. (Currently Amended) The method of claim 1, wherein said antibody or antibody fragment

~~non-nucleic acid recognition~~ portion comprises a Fab fragment.

17. (Previously Presented) The method of claim 16, wherein said Fab fragment is attached to said nucleic acid portion through the free sulfhydryl of the Fab fragment.

18. (Canceled)

19. (Previously Presented) The method of claim 1, wherein said nucleic acid portion comprises DNA.

20. (Previously Presented) The method of claim 1, wherein said nucleic acid portion comprises RNA.

21. (Currently Amended) The method of claim 1, wherein said nucleic acid portion comprises a nucleic sequence that does not include a sequence that is expected to be found in the biological or environmental sample.

22. (Currently Amended) The method of claim 1, wherein said step (a) comprises providing two or more different types of binding constructs, wherein each of said two or more different binding constructs has a different antibody or antibody fragment ~~non-nucleic acid recognition~~ portion and a different nucleic acid portion.

23. (Currently Amended) A method for increasing the sensitivity of solution-phase detection of a non-nucleic acid compound of interest, comprising the steps of:

a) providing a biological or environmental sample suspected of containing said non-nucleic acid compound of interest;
b) providing a binding construct comprising:

i) an antibody or an antibody fragment ~~a non-nucleic acid recognition~~ portion capable of specifically binding said non-nucleic acid compound of interest without capture on a solid support, and

ii) a nucleic acid portion

c) contacting said biological or environmental sample with said binding construct for a period of time sufficient to permit said antibody or antibody fragment ~~non-nucleic acid recognition~~ portion to specifically bind said non-nucleic acid compound of interest present in said biological or environmental sample, thereby forming construct-compound complexes in solution, wherein ~~essentially all of~~ said non-nucleic acid compound of interest in said biological sample becomes specifically bound to said binding construct;

d) providing one or more surfaces, wherein said one or more surfaces bears one or more accessible non-nucleic acid binding targets capable of specifically binding to said antibody or antibody fragment ~~non-nucleic acid recognition~~ portion;

e) contacting said one or more surfaces with said solution after ~~essentially all of~~ said non-nucleic acid compound of interest in said biological or environmental sample has become bound to said binding construct for a period of time sufficient for said one or more accessible non-nucleic acid binding target to specifically bind said antibody or antibody fragment ~~non-nucleic acid recognition~~ portion of any ~~and essentially all~~ binding construct not bound to said non-nucleic acid compound of interest, thereby forming construct-surface complexes in said solution resulting in said solution containing essentially said construct-complexes and said construct-surface complexes;

f) separating said construct-surface complexes from said solution, leaving said construct-compound complexes in said solution ; and

g) detecting the presence or absence of said nucleic acid portion of said binding construct in said solution without capture on a solid support,

wherein said separation of said construct-surface complexes from said solution results in a separation of ~~essentially~~ all binding constructs not bound to a non-nucleic acid compound of interest and in an increased sensitivity of detection of said non-nucleic acid compound of interest, and

wherein the presence of said nucleic acid portion of said binding construct indicates the presence of said non-nucleic acid compound of interest in said biological or environmental sample.

24. (Previously Presented) The method of claim 23, wherein said one or more surfaces is selected from the group consisting of: particles, powders, beads, planar surfaces, non-planar surfaces, a tube, a well, non-porous films, non-porous membranes, porous films, porous membranes, fibers, fillers, meshes, grids, filters, matrices, gels, and combinations thereof.

25. (Currently Amended) The method of claim 23, wherein said one or more surfaces ~~comprises~~ comprise particles.

26. (Previously Presented) The method of claim 25, wherein said particles comprise magnetic particles.

27. (Previously Presented) The method of claim 26, wherein said step (f) comprises separating substantially all said construct-surface complexes from said solution by means of a magnet.

28. (Previously Presented) The method of claim 23, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

29. (Previously Presented) The method of claim 23, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

30. (Previously Presented) The method of claim 29, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

31. (Previously Presented) The method of claim 27, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

32. (Previously Presented) The method of claim 27, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

33. (Previously Presented) The method of claim 32, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Currently Amended) The method of claim 23, wherein said antibody or antibody fragment

~~non-nucleic acid recognition~~ portion comprises a single chain antibody variable region fragment.

38. (Currently Amended) The method of claim 22, wherein said antibody or antibody fragment ~~non-nucleic acid recognition~~ portion comprises a Fab fragment.

39. (Previously Presented) The method of claim 38, wherein said Fab fragment is attached to said nucleic acid portion through the free sulfhydryl of the Fab fragment.

40. (Canceled)

41. (Previously Presented) The method of claim 23, wherein said nucleic acid portion comprises DNA.

42. (Previously Presented) The method of claim 23, wherein said nucleic acid portion comprises RNA.

43. (Currently Amended) The method of claim 23, wherein said nucleic acid portion comprises a nucleic sequence that does not include a sequence that is expected to be found in ~~the~~ said biological sample.

44. (Currently Amended) The method of claim 23, wherein said step (b) comprises providing two or more different types of binding constructs, wherein each of said two or more different binding constructs has a different antibody or antibody fragment ~~non-nucleic acid recognition~~ portion and a different nucleic acid portion.

45. (Cancel)

46. (Cancel)